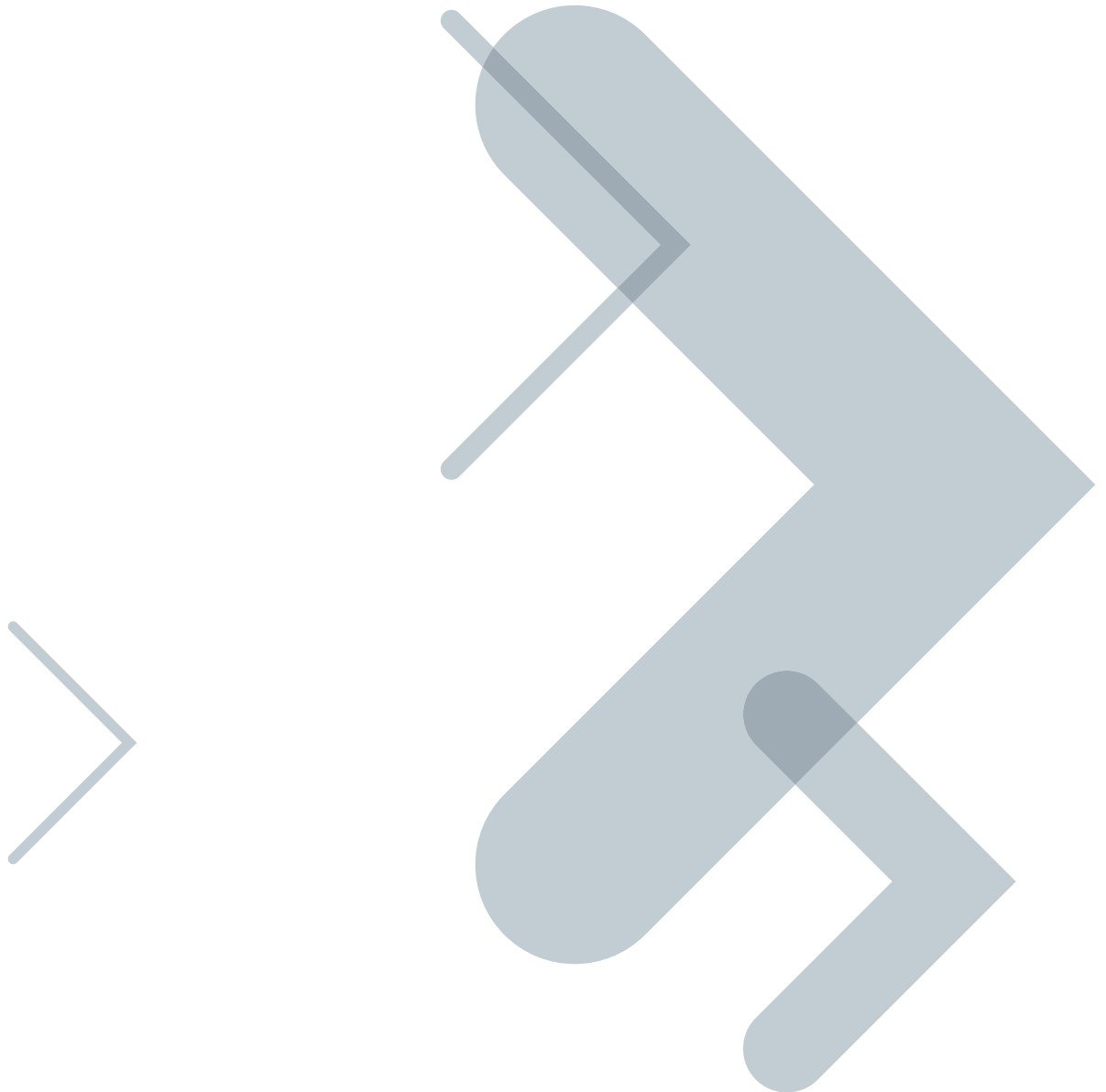




Responding to Current Trends and Evolving Requirements for Conditional Access



With the move toward distributed digital content ever increasing, and the requirements for content protection evolving, there have been many recent trends driving operators' needs for Conditional Access (CA) technology. In particular, the Federal Communications Commission (FCC) mandate for separation of CA in digital set-tops has created a near-term disruptive catalyst centered on the use of commercially available CableCARDS™. Meanwhile, long-term requirements for software driven, downloadable security are still being defined.

This solutions paper provides an overview of the industry drivers and evolving requirements for CA and explains how our history of providing industry-leading broadband solutions allows Motorola to support network operators as they migrate from embedded set-tops to Host products to downloadable CA technologies. It discusses the deployment challenges operators face in implementing Host platforms and explains the need for a gradual migration path to downloadable security.

Conditional Access: Drivers and Recent Trends

CA is a vehicle to enable operators to protect their content — and their revenue streams — against theft, and it allows them the flexibility to define and implement fair billing practices for access to premium channels and services. Set-tops have traditionally utilized embedded security to provide CA. The embedded security consists of dedicated component(s) and circuitry in the set-top, which regulates the CA scheme. In recent years, regulatory requirements and industry demands have created the need for security measures that are separable from the set-top. This requirement has been driven by the goal of portability of set-tops and to promote the option of retail players entering the market.

As a pioneer in CA and protection schemes for content delivery networks, Motorola has helped network operators ensure the secure distribution of content for decades. These set-tops rely on Motorola's widely deployed MediaCipher® security and access control system. Motorola is now offering "separable CA" Host products and in the future will offer downloadable solutions.

First launched in 1993, Motorola's MediaCipher conditional access technology spans digital satellite, cable, and terrestrial domains and is recognized as providing comprehensive access control functionality and unsurpassed security. The MediaCipher addressable access control system allows operators to rapidly launch a variety of revenue-producing services by supporting features that include service authorizations, impulse pay-per-view, authenticated report-back processing, secured software download, and world-class encryption technology. Motorola will continue to leverage MediaCipher to support evolving CA requirements.

CONTENT PROTECTION

Operators need and are obligated to protect content from the source to the subscriber. This requires the ability to encrypt traffic flows while allowing customers to seamlessly access content according to authorization granted by paid subscriptions. Set-tops with embedded security perform several critical functions. They decode premium programming such as movie channels and provide interactive, two-way communications for services such as interactive programming guides, pay-per-view, and video on-demand.

FCC REQUIREMENTS

Separable security, or Host technology, has evolved primarily in response to Federal requirements in the United States, and CA has evolved in response to the U.S. Telecommunications Act of 1996. It is meant to create a level playing field so that consumer electronics companies can mass-market cable set-top platforms at retail to promote increased competition, allow set-tops to be owned by consumers, and provide portability for a consumers that move to a location served by a different cable operator.

The FCC developed regulations to assure the commercial availability of set-tops through retail channels and separate the security from the non-security function in a device. The FCC now prohibits cable operators from providing new integrated set-tops with embedded security. The FCC established July 1, 2007 as the date when cable operators in the United States must depend on CableCARD solutions for new set-top deployments.

Hosts and CableCARDS

A Host platform could be a set-top or a television where CA is managed through a portable device such as a CableCARD. It incorporates all the necessary security functions needed to integrate a set-top into a CA system. A CableCARD is then mated with the respective Host set-top and is responsible for enabling decryption of that content if the user is authorized to access it.

CableLabs® is a non-profit research and development consortium dedicated to helping its cable operator members integrate new cable telecommunications technology into their business objectives. CableLabs defined requirements for what is now referred to as a CableCARD. It incorporates all the necessary security functions needed to create a CA system. A CableCARD is responsible for detecting whether a user is authorized to view certain content, and then for decrypting that content if the user is authorized to access it.

A CableCARD is physically a PCMCIA Type 2 PC card form factor that is inserted into a slot in the Host—which can either be a digital television set or a stand-alone Host set-top—to identify and authorize the customer and to provide proprietary decoding of the encrypted digital signal. The tuner and QPSK demodulator themselves are part of the Host device as is the MPEG decoder. The role of the card is to handle the CA and network messaging for the Host.

Host migration requires teaming with an established industry leader that can provide end-to-end solutions that support CableCARD based Host deployments now as well as downloadable CA in the future. Motorola is a proven leader in set-tops and has shipped over 60 million digital entertainment devices, including over ten million High-Definition (HD) set-tops.

Regulatory requirements have shifted cable operators in the United States toward deploying Host set-tops. The FCC mandated July 1, 2007 as the date for the embedded security ban. Since this date, cable operators in the United States have been restricted from deploying new set-tops with embedded security, although they would still be allowed to install embedded units from their existing deployed inventory. Operators now utilize host set-tops with removable security, coupled with equivalent functionality to current set-top product lines, so they can continuously and seamlessly add new customers to the network.

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Deploying Host platforms requires a holistic view of infrastructure requirements, and Motorola provides the professional services expertise and the proven products and technologies that can help operators leverage their existing infrastructure investments to enable the delivery of Host platforms. From the head-end to the home, Motorola provides proven technologies that allow operators to minimize risks while complying with regulatory requirements and ensuring the ongoing delivery of high-value content and services to subscribers.

Motorola is developing its product line to satisfy evolving operator requirements for subscriber access. Proven software applications that have been deployed on fielded set-tops have been migrated to enable that rich functionality in Host applications. Operators can therefore benefit from specialized versions of legacy software stacks already deployed by network operators worldwide, while they can leverage new applications built using the tru2way™ specification, a middleware software layer specification that allows service providers to launch exciting digital services and applications.

MOTOROLA CABLECARD

The Motorola CableCARD is part of the Motorola MediaCipher CA system, delivering the same level of digital security that is available today in embedded Motorola set-tops deployed worldwide. This module supports unidirectional signaling and offers completely separable security for consumer electronics devices, in adherence to current FCC requirements. Motorola was among the first vendors to demonstrate CableCARD/Host interoperability, and in July 2003 Motorola received CableCARD-compliance qualification from CableLabs.

MOTOROLA MULTI-STREAM CABLECARD

The Motorola Multi-stream CableCARD (M-Card) allows consumers to watch and/or record their programming from multiple, simultaneous tuners using a single CableCARD. It supports multi-directional signaling and advanced features, and it enables interactive and pay-per-view services.

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HOST SET-TOPS

Motorola manufactures and distributes a portfolio of Host set-top boxes designed to comply with the FCC mandate for separable security. These CableCARD-ready Host set-tops include Standard-Definition (SD), HD, and HD/DVR variants and include a compliment of data and audio visual interfaces. When configured with the MoCA™ home-networking option, Host set-tops can also serve as multimedia hubs or clients. Motorola Host set-tops enable consumers to enjoy a superior digital viewing experience and include the DCH and DCX model series.

The latest Motorola Host set-top, the DCX Series, enables consumers to enjoy a superior and rich digital cable viewing experience. Based on the model, these products deliver SD or HD video that can be scaled to 720p or 1080i resolution, surround sound audio, a hard drive for time-shifting of TV shows and storage of customer-created media, and advanced processing—all for bringing a full world of on-demand and interactive digital cable programming into the connected home.

Motorola DCX set-tops are also built to deliver the Motorola Follow Me TV™ experience, which enables consumers to place-shift video, pictures, music, and more throughout their home and to their compatible mobile devices. The product family includes an array of interfaces, including High-Definition Multimedia Interface (HDMI®), optical and coaxial digital audio outputs, IEEE 1394a, USB, and Ethernet for seamlessly linking the set-top with home theater systems or media networks.

Additionally, the DCX Host set-tops are capable of decoding both MPEG-2 and MPEG-4 formats as well as advanced audio codecs. These advanced set-tops also offer more memory and processing power to support more feature rich applications. The DCX series employs a 1GHz tuner which offers a higher spectrum of usable bandwidth, as well a MoCA option for multi-room DVR and home connectivity.

Motorola Host set-tops bring a full world of on-demand and interactive digital programming into the connected home. All products comply with the FCC separable security mandate with support for CableCARD technology. In addition, these products support Motorola's legacy application platforms and future proposed platforms such as tru2way™.

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FROM THE SOURCE TO THE SUBSCRIBER...

Motorola not only offers the Host platforms and CableCARDS to support CA in the home, it provides the end-to-end solutions that secure content from the headend to the home. The Motorola Digital Addressable Controller (DAC) 6000 consists of several advanced components that provide the latest in security and control for flexible digital systems. With an easy-to-use menu-drive system, the Motorola DAC provides support for a wide variety of addressable control functions. To control these services and functions, the Motorola DAC is fully compatible with most billing systems through the WireLink protocol.

Even though network operators are only now implementing Host migration, they should also consider the future impact of Downloadable Conditional Access (DCAS). DCAS, in essence, will move the security functions of a CableCARD into a software program that can be downloaded into a supporting set-top device.

Motorola also offers the Copy Protection Management System (CPMS), which is a headend device that manages the new content copy protection and CableCARD validation parameters and is required to deliver high-value content on a Host device paired with a CableCARD. Motorola supports Host migration, and network operators can work with Motorola to access the professional services and expertise that can complement internal staff and support migration efforts. The Motorola Technical Resource Center (TRC) is available to provide best practices support for service providers so they can access proven policies and procedures for Host migration.

Evolving to Downloadable Conditional Access

Even though network operators are only now implementing Host migration, they should also consider the future impact of Downloadable Conditional Access (DCAS). DCAS, in essence, will move the security functions of a CableCARD into a software program that can be downloaded into a supporting set-top device. DCAS is being designed to replace the removable hardware approach to signal security implemented in CableCARD offerings.

The National Cable and Telecommunications Association (NCTA) has reported to the FCC that it is feasible and preferable to move security away from CableCARD and to DCAS. Instead of using a CableCARD hardware key for authentication and encryption, a common security chip could be embedded within Host platforms to receive a software security key downloaded from the network operator. Once received, the local CA functionality would be accomplished via resident software that has been downloaded to the set-top.

DCAS is a combination of traditional CA and an emerging downloadable software-based model. The blending of software- and hardware-based encryption in DCAS will also enable content transfer from a set-top to a personal media player or a mobile phone to support flexible and innovative services for consumers.

The long-term advantage of DCAS may lie in its ability to reduce operating costs. Network operators can potentially provision and deliver new services more easily, and they can potentially simplify maintenance and troubleshooting while minimizing infrastructure costs. Motorola has been actively involved in the definition and specification of DCAS standards, and will leverage its expertise in embedded set-tops and Host solutions to offer DCAS solutions in the future.

Motorola, a pioneer in set-top security, has a history of delivering proven security solutions that allow service providers to secure digital content. The company has developed a core competency in providing residential and corporate access to broadband infrastructure, and just as Motorola's solutions have evolved from embedded set-tops to Host and CableCARD CA solutions, Motorola will evolve with market requirements and maintain its industry leadership as it offers DCAS solutions in the future.



Services and Support for Evolving CA Requirements

The ongoing evolution of broadband infrastructure requires flexibility and expertise to cost-effectively adapt the network to support regulatory requirements and customer demands. Network operators face a set of dynamic challenges that must be successfully addressed to transition to Host solutions in the near future and potentially to DCAS as well.

Motorola offers proven set-top technologies that network operators worldwide have relied on for years to evolve their networks and offer new services. Motorola has the products, technologies, and professional services expertise to help operators migrate their network infrastructure to address new challenges and opportunities. Motorola has an unmatched track record in delivering excellent video quality and superb consumer experiences, and innovations through the broad Motorola product line enable beyond-the-box experiences such as Follow Me TV that integrate broadband services with cellular phones, digital cameras, and other technologies that enrich the consumer experience.

Host migration is not about selecting a CableCARD or simply a new set-top model; it is about selecting a vendor of products and services that can help operators define a program plan that can help them efficiently manage network and technology migrations. Motorola is the leader in today's set-top market and is positioned to help network operators efficiently migrate to support new technologies, applications, and interactive services.



MOTOROLA

Motorola, Inc. www.motorola.com

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